

- 1 -

## SEQUENCE LISTING

&lt;110&gt; DANA-FARBER CANCER INSTITUTE

&lt;120&gt; LYMPHOMA ASSOCIATED MOLECULES AND USES THEREFOR

&lt;130&gt; DFN-031PC

&lt;140&gt;

&lt;141&gt;

&lt;150&gt; USSN 60/106,383

&lt;151&gt; 1998-10-29

&lt;150&gt; USSN 60/106,448

&lt;151&gt; 1998-10-30

&lt;160&gt; 6

&lt;170&gt; PatentIn Ver. 2.0

&lt;210&gt; 1

&lt;211&gt; 3243

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (229)..(2790)

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Met Asp Phe

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Ser Met Val Ala Gly Ala Ala Tyr Asn Glu Lys Ser Gly Arg Ile

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Thr Ser Leu Ser Leu Leu Phe Gln Lys Val Phe Ala Gln Ile Phe Pro

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cag tgg aga aag ggg aat aca gaa gaa tgt ctc ccc tac aag tgc tca 381

Gln Trp Arg Lys Gly Asn Thr Glu Glu Cys Leu Pro Tyr Lys Cys Ser

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gag act ggt gct ctt gga gaa aac tat agt tgg caa att ccc att aac 429

Glu Thr Gly Ala Leu Gly Glu Asn Tyr Ser Trp Gln Ile Pro Ile Asn

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cac aat gac ttc aaa att tta aaa aat aat gag cgt cag ctg tgt gaa 477

- 2 -

His	Asn	Asp	Phe	Lys	Ile	Leu	Lys	Asn	Asn	Glu	Arg	Gln	Leu	Cys	Glu	
70							75					80				
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Val	Leu	Gln	Asn	Lys	Phe	Gly	Cys	Ile	Ser	Thr	Leu	Val	Ser	Pro	Val	
85							90					95				
cag	gaa	ggc	aac	agc	aaa	tct	ctg	caa	gtg	ttc	aga	aaa	atg	ctg	act	573
Gln	Glu	Gly	Asn	Ser	Lys	Ser	Leu	Gln	Val	Phe	Arg	Lys	Met	Leu	Thr	
100							105					110			115	
cct	agg	ata	gag	tta	tca	gtc	tgg	aaa	gat	gac	ctc	acc	aca	cat	gct	621
Pro	Arg	Ile	Glu	Leu	Ser	Val	Trp	Lys	Asp	Asp	Leu	Thr	Thr	His	Ala	
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Val	Asp	Ala	Val	Val	Asn	Ala	Ala	Asn	Glu	Asp	Leu	Leu	His	Gly	Gly	
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Gly	Leu	Ala	Leu	Ala	Leu	Val	Lys	Ala	Gly	Gly	Phe	Glu	Ile	Gln	Glu	
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Glu	Ser	Lys	Gln	Phe	Val	Ala	Arg	Tyr	Gly	Val	Ser	Ala	Gly	Glu		
165							170					175				
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Ile	Ala	Val	Thr	Gly	Ala	Gly	Arg	Leu	Pro	Cys	Lys	Gln	Ile	Ile	His	
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Ala	Val	Gly	Pro	Arg	Trp	Met	Glu	Trp	Asp	Lys	Gln	Gly	Cys	Thr	Gly	
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Lys	Leu	Gln	Arg	Ala	Ile	Val	Ser	Ile	Leu	Asn	Tyr	Val	Ile	Tyr	Lys	
215							220					225				
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1101																
His	Leu	Val	Ser	Asn	Glu	Asp	Pro	Thr	Val	Ala	Ala	Phe	Lys	Ala	Ala	
280							285					290				

- 3 -

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295 300 305

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1197  
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310 315 320

ggc cac att gaa tgg cag acg gca gat gta att gtt aat tct gta aac  
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cca cat gat att aca gtt gga cct gtg gca aag tca att cta caa caa  
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375 380 385

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390 395 400

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1485  
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405 410 415

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440 445 450

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455 460 465

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470

475

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1773

Ser Thr Arg Glu Glu Lys Arg Glu Asn Gly Leu Glu Ala Arg Ser Pro  
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gcc atc aat ctg atg gga ttc aac gtg gaa gag atg tat gag gcc cac  
1821

Ala Ile Asn Leu Met Gly Phe Asn Val Glu Glu Met Tyr Glu Ala His  
520 525 530

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1869

Ala Trp Ile Gln Arg Ile Leu Ser Leu Gln Asn His His Ile Ile Glu  
535 540 545

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1917

Asn Asn His Ile Leu Tyr Leu Gly Arg Lys Glu His Asp Ile Leu Ser  
550 555 560

cag ctt cag aaa act tca agt gtc tcc atc aca gaa att atc agc cca  
1965

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565 570 575

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2013

Gly Arg Thr Glu Leu Glu Ile Glu Gly Ala Arg Ala Asp Leu Ile Glu  
580 585 590 595

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2061

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600 605 610

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Ala Arg Lys Lys Glu Arg Gly Leu Trp Arg Ser Leu Gly Gln Trp Thr  
615 620 625

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2157

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Leu Lys Cys Pro Val Pro Pro Thr Gln Glu Leu Leu Asp Gln Lys Lys  
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- 5 -

2253  
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Cys Gln Gly His Pro Leu Asn Ile Val Pro Pro Pro Leu Ser Pro Gly  
775 780 785  
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2637  
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790 795 800  
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2685  
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aca tgc acc cag gaa tat gta cag tca caa gat tac tca tca gga cca  
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2781  
Met Arg Pro Phe Ala Gln His Pro Trp Arg Gly Phe Ala Ser Gly Ser  
840 845 850

- 6 -

cct gtt gat taatctctac atcattttaa cagctggtat ggcccttacct  
2830

Pro Val Asp

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<213> Homo sapiens

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35 40 45

Lys Cys Ser Glu Thr Gly Ala Leu Gly Glu Asn Tyr Ser Trp Gln Ile  
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Pro Ile Asn His Asn Asp Phe Lys Ile Leu Lys Asn Asn Glu Arg Gln  
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Leu Cys Glu Val Leu Gln Asn Lys Phe Gly Cys Ile Ser Thr Leu Val  
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Ser Pro Val Gln Glu Gly Asn Ser Lys Ser Leu Gln Val Phe Arg Lys  
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Thr His Ala Val Asp Ala Val Val Asn Ala Ala Asn Glu Asp Leu Leu

- 7 -

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Ile	Ile	His	Ala	Val	Gly	Pro	Arg	Trp	Met	Glu	Trp	Asp	Lys	Gln	Gly
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Cys	Thr	Gly	Lys	Leu	Gln	Arg	Ala	Ile	Val	Ser	Ile	Leu	Asn	Tyr	Val
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Ile	Tyr	Lys	Asn	Thr	His	Ile	Lys	Thr	Val	Ala	Ile	Pro	Ala	Leu	Ser
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Ser	Gly	Ile	Phe	Gln	Phe	Pro	Leu	Asn	Leu	Cys	Thr	Lys	Thr	Ile	Val
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Glu	Thr	Ile	Arg	Val	Ser	Leu	Gln	Gly	Lys	Pro	Met	Met	Ser	Asn	Leu
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Lys	Glu	Ile	His	Leu	Val	Ser	Asn	Glu	Asp	Pro	Thr	Val	Ala	Ala	Phe
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Lys	Ala	Ala	Ser	Glu	Phe	Ile	Leu	Gly	Lys	Ser	Glu	Leu	Gly	Gln	Glu
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Ser	Val	Asn	Pro	His	Asp	Ile	Thr	Val	Gly	Pro	Val	Ala	Lys	Ser	Ile
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Ala	Lys	Gln	Phe	Gln	Arg	Ser	Gln	Leu	Val	Leu	Val	Thr	Lys	Gly	Phe
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Pro	Lys	Pro	Gln	Ile	Leu	Lys	His	Ala	Met	Lys	Glu	Cys	Leu	Glu	Lys
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Cys	Ile	Glu	Gln	Asn	Ile	Thr	Ser	Ile	Ser	Phe	Pro	Ala	Leu	Gly	Thr
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Gly	Asn	Met	Glu	Ile	Lys	Lys	Glu	Thr	Ala	Ala	Glu	Ile	Leu	Phe	Asp
				435				440				445			

- 8 -

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Val Pro Gln Ser Thr Arg Glu Glu Lys Arg Glu Asn Gly Leu Glu Ala  
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Ile Ile Glu Asn Asn His Ile Leu Tyr Leu Gly Arg Lys Glu His Asp  
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Ile Ser Pro Gly Arg Thr Glu Leu Glu Ile Glu Gly Ala Arg Ala Asp  
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Glu Glu Met Ala Arg Lys Lys Glu Arg Gly Leu Trp Arg Ser Leu Gly  
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Gln Trp Thr Ile Gln Gln Lys Thr Gln Asp Glu Met Lys Glu Asn  
625 630 635 640

Ile Ile Phe Leu Lys Cys Pro Val Pro Pro Thr Gln Glu Leu Leu Asp  
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Gln Lys Lys Gln Phe Glu Lys Cys Gly Leu Gln Val Leu Lys Val Glu  
660 665 670

Lys Ile Asp Asn Glu Val Leu Met Ala Ala Phe Gln Arg Lys Lys Lys  
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705 710 715 720

Gln Arg Met Tyr Ser Thr Pro Cys Asp Pro Lys Tyr Gly Ala Gly Ile  
725 730 735

Tyr Phe Thr Lys Asn Leu Lys Asn Leu Ala Glu Lys Ala Lys Lys Ile  
740 745 750

- 9 -

Ser Ala Ala Asp Lys Leu Ile Tyr Val Phe Glu Ala Glu Val Leu Thr  
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Gly Phe Phe Cys Gln Gly His Pro Leu Asn Ile Val Pro Pro Pro Leu  
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Ser Pro Gly Ala Ile Asp Gly His Asp Ser Val Val Asp Asn Val Ser  
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Ser Pro Glu Thr Phe Val Ile Phe Ser Gly Met Gln Ala Ile Pro Gln  
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Tyr Leu Trp Thr Cys Thr Gln Glu Tyr Val Gln Ser Gln Asp Tyr Ser  
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Ser Gly Ser Pro Val Asp  
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 Gly Arg Ile Thr Ser Leu Ser Leu Leu Phe Gln Lys Val Phe Ala Gln  
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 Ile Phe Pro Gln Trp Arg Lys Gly Asn Thr Glu Glu Cys Leu Pro Tyr  
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aag tgc tca gag act ggt gct ctt gga gaa aac tat agt tgg caa att 192  
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 Pro Ile Asn His Asn Asp Phe Lys Ile Leu Lys Asn Asn Glu Arg Gln  
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 85 90 95

tct cca gtt cag gaa ggc aac agc aaa tct ctg caa gtg ttc aga aaa 336  
 Ser Pro Val Gln Glu Gly Asn Ser Lys Ser Leu Gln Val Phe Arg Lys

- 10 -

100

105

110

atg ctg act cct agg ata gag tta tca gtc tgg aaa gat gac ctc acc	384																																																																																																												
Met Leu Thr Pro Arg Ile Glu Leu Ser Val Trp Lys Asp Asp Leu Thr																																																																																																													
115	120	125		aca cat gct gtt gat gct gtg gtg aat gca gcc aat gaa gat ctt ctg	432	Thr His Ala Val Asp Ala Val Val Asn Ala Ala Asn Glu Asp Leu Leu		130	135	140		cat ggg gga ggc ctg gcc ctg gta aaa gct ggt gga ttt gaa	480	His Gly Gly Gly Leu Ala Leu Ala Leu Val Lys Ala Gly Gly Phe Glu		145	150	155	160	atc caa gaa gag agc aaa cag ttt gtt gcc aga tat ggt aaa gtg tca	528	Ile Gln Glu Glu Ser Lys Gln Phe Val Ala Arg Tyr Gly Lys Val Ser		165	170	175		gct ggt gag ata gct gtc acg gga gca ggg agg ctt ccc tgc aaa cag	576	Ala Gly Glu Ile Ala Val Thr Gly Ala Gly Arg Leu Pro Cys Lys Gin		180	185	190		atc atc cat gct ggg cct cgg tgg atg gaa tgg gat aaa cag gga	624	Ile Ile His Ala Val Gly Pro Arg Trp Met Glu Trp Asp Lys Gln Gly		195	200	205		tgt act gga aag ctg cag agg gcc att gta agt att ctg aat tat gtc	672	Cys Thr Gly Lys Leu Gln Arg Ala Ile Val Ser Ile Leu Asn Tyr Val		210	215	220		atc tat aaa aat act cac att aag aca gta gca att cca gcc ttg agc	720	Ile Tyr Lys Asn Thr His Ile Lys Thr Val Ala Ile Pro Ala Leu Ser		225	230	235	240	tct ggg att ttt cag ttc cct ctg aat ttg tgt aca aag act att gta	768	Ser Gly Ile Phe Gln Phe Pro Leu Asn Leu Cys Thr Lys Thr Ile Val		245	250	255		gag act atc cgg gtt agt ttg caa ggg aag cca atg atg agt aat ttg	816	Glu Thr Ile Arg Val Ser Leu Gln Gly Lys Pro Met Met Ser Asn Leu		260	265	270		aaa gaa att cac ctg gtg agc aat gag gac cct act gtt gct gcc ttt	864	Lys Glu Ile His Leu Val Ser Asn Glu Asp Pro Thr Val Ala Ala Phe		275	280	285		aaa gct gct tca gaa ttc atc cta ggg aag agt gag ctg gga caa gaa	912	Lys Ala Ala Ser Glu Phe Ile Leu Gly Lys Ser Glu Leu Gly Gln Glu		290	295	300		acc acc cct tct ttc aat gca atg gtc gtg aac aac ctg acc ctc cag	960	Thr Thr Pro Ser Phe Asn Ala Met Val Val Asn Asn Leu Thr Leu Gln		305	310	315	320	att gtc cag ggc cac att gaa tgg cag acg gca gat gta att gtt aat		1008		Ile Val Gln Gly His Ile Glu Trp Gln Thr Ala Asp Val Ile Val Asn		325	330	335	
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130	135	140		cat ggg gga ggc ctg gcc ctg gta aaa gct ggt gga ttt gaa	480	His Gly Gly Gly Leu Ala Leu Ala Leu Val Lys Ala Gly Gly Phe Glu		145	150	155	160	atc caa gaa gag agc aaa cag ttt gtt gcc aga tat ggt aaa gtg tca	528	Ile Gln Glu Glu Ser Lys Gln Phe Val Ala Arg Tyr Gly Lys Val Ser		165	170	175		gct ggt gag ata gct gtc acg gga gca ggg agg ctt ccc tgc aaa cag	576	Ala Gly Glu Ile Ala Val Thr Gly Ala Gly Arg Leu Pro Cys Lys Gin		180	185	190		atc atc cat gct ggg cct cgg tgg atg gaa tgg gat aaa cag gga	624	Ile Ile His Ala Val Gly Pro Arg Trp Met Glu Trp Asp Lys Gln Gly		195	200	205		tgt act gga aag ctg cag agg gcc att gta agt att ctg aat tat gtc	672	Cys Thr Gly Lys Leu Gln Arg Ala Ile Val Ser Ile Leu Asn Tyr Val		210	215	220		atc tat aaa aat act cac att aag aca gta gca att cca gcc ttg agc	720	Ile Tyr Lys Asn Thr His Ile Lys Thr Val Ala Ile Pro Ala Leu Ser		225	230	235	240	tct ggg att ttt cag ttc cct ctg aat ttg tgt aca aag act att gta	768	Ser Gly Ile Phe Gln Phe Pro Leu Asn Leu Cys Thr Lys Thr Ile Val		245	250	255		gag act atc cgg gtt agt ttg caa ggg aag cca atg atg agt aat ttg	816	Glu Thr Ile Arg Val Ser Leu Gln Gly Lys Pro Met Met Ser Asn Leu		260	265	270		aaa gaa att cac ctg gtg agc aat gag gac cct act gtt gct gcc ttt	864	Lys Glu Ile His Leu Val Ser Asn Glu Asp Pro Thr Val Ala Ala Phe		275	280	285		aaa gct gct tca gaa ttc atc cta ggg aag agt gag ctg gga caa gaa	912	Lys Ala Ala Ser Glu Phe Ile Leu Gly Lys Ser Glu Leu Gly Gln Glu		290	295	300		acc acc cct tct ttc aat gca atg gtc gtg aac aac ctg acc ctc cag	960	Thr Thr Pro Ser Phe Asn Ala Met Val Val Asn Asn Leu Thr Leu Gln		305	310	315	320	att gtc cag ggc cac att gaa tgg cag acg gca gat gta att gtt aat		1008		Ile Val Gln Gly His Ile Glu Trp Gln Thr Ala Asp Val Ile Val Asn		325	330	335									
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145	150	155	160	atc caa gaa gag agc aaa cag ttt gtt gcc aga tat ggt aaa gtg tca	528	Ile Gln Glu Glu Ser Lys Gln Phe Val Ala Arg Tyr Gly Lys Val Ser		165	170	175		gct ggt gag ata gct gtc acg gga gca ggg agg ctt ccc tgc aaa cag	576	Ala Gly Glu Ile Ala Val Thr Gly Ala Gly Arg Leu Pro Cys Lys Gin		180	185	190		atc atc cat gct ggg cct cgg tgg atg gaa tgg gat aaa cag gga	624	Ile Ile His Ala Val Gly Pro Arg Trp Met Glu Trp Asp Lys Gln Gly		195	200	205		tgt act gga aag ctg cag agg gcc att gta agt att ctg aat tat gtc	672	Cys Thr Gly Lys Leu Gln Arg Ala Ile Val Ser Ile Leu Asn Tyr Val		210	215	220		atc tat aaa aat act cac att aag aca gta gca att cca gcc ttg agc	720	Ile Tyr Lys Asn Thr His Ile Lys Thr Val Ala Ile Pro Ala Leu Ser		225	230	235	240	tct ggg att ttt cag ttc cct ctg aat ttg tgt aca aag act att gta	768	Ser Gly Ile Phe Gln Phe Pro Leu Asn Leu Cys Thr Lys Thr Ile Val		245	250	255		gag act atc cgg gtt agt ttg caa ggg aag cca atg atg agt aat ttg	816	Glu Thr Ile Arg Val Ser Leu Gln Gly Lys Pro Met Met Ser Asn Leu		260	265	270		aaa gaa att cac ctg gtg agc aat gag gac cct act gtt gct gcc ttt	864	Lys Glu Ile His Leu Val Ser Asn Glu Asp Pro Thr Val Ala Ala Phe		275	280	285		aaa gct gct tca gaa ttc atc cta ggg aag agt gag ctg gga caa gaa	912	Lys Ala Ala Ser Glu Phe Ile Leu Gly Lys Ser Glu Leu Gly Gln Glu		290	295	300		acc acc cct tct ttc aat gca atg gtc gtg aac aac ctg acc ctc cag	960	Thr Thr Pro Ser Phe Asn Ala Met Val Val Asn Asn Leu Thr Leu Gln		305	310	315	320	att gtc cag ggc cac att gaa tgg cag acg gca gat gta att gtt aat		1008		Ile Val Gln Gly His Ile Glu Trp Gln Thr Ala Asp Val Ile Val Asn		325	330	335																	
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225	230	235	240	tct ggg att ttt cag ttc cct ctg aat ttg tgt aca aag act att gta	768	Ser Gly Ile Phe Gln Phe Pro Leu Asn Leu Cys Thr Lys Thr Ile Val		245	250	255		gag act atc cgg gtt agt ttg caa ggg aag cca atg atg agt aat ttg	816	Glu Thr Ile Arg Val Ser Leu Gln Gly Lys Pro Met Met Ser Asn Leu		260	265	270		aaa gaa att cac ctg gtg agc aat gag gac cct act gtt gct gcc ttt	864	Lys Glu Ile His Leu Val Ser Asn Glu Asp Pro Thr Val Ala Ala Phe		275	280	285		aaa gct gct tca gaa ttc atc cta ggg aag agt gag ctg gga caa gaa	912	Lys Ala Ala Ser Glu Phe Ile Leu Gly Lys Ser Glu Leu Gly Gln Glu		290	295	300		acc acc cct tct ttc aat gca atg gtc gtg aac aac ctg acc ctc cag	960	Thr Thr Pro Ser Phe Asn Ala Met Val Val Asn Asn Leu Thr Leu Gln		305	310	315	320	att gtc cag ggc cac att gaa tgg cag acg gca gat gta att gtt aat		1008		Ile Val Gln Gly His Ile Glu Trp Gln Thr Ala Asp Val Ile Val Asn		325	330	335																																																									
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tct gta aac cca cat gat.att aca gtt gga cct gtg gca aag tca att  
1056

Ser Val Asn Pro His Asp Ile Thr Val Gly Pro Val Ala Lys Ser Ile  
340 345 350

cta caa caa gca gga gtt gaa atg aaa tcg gaa ttt ctt gcc aca aag  
1104

Leu Gln Gln Ala Gly Val Glu Met Lys Ser Glu Phe Leu Ala Thr Lys  
355 360 365

gct aaa cag ttt caa cgg tcc cag ttg gta ctg gtc aca aaa gga ttt  
1152

Ala Lys Gln Phe Gln Arg Ser Gln Leu Val Leu Val Thr Lys Gly Phe  
370 375 380

aac ttg ttc tgt aaa tat ata tac cat gta ctg tgg cat tca gaa ttt  
1200

Asn Leu Phe Cys Lys Tyr Ile Tyr His Val Leu Trp His Ser Glu Phe  
385 390 395 400

cct aaa cct cag ata tta aaa cat gca atg aag gag tgt ttg gaa aaa  
1248

Pro Lys Pro Gln Ile Leu Lys His Ala Met Lys Glu Cys Leu Glu Lys  
405 410 415

tgc att gag caa aat ata act tcc att tcc ttt cct gcc ctt ggg act  
1296

Cys Ile Glu Gln Asn Ile Thr Ser Ile Ser Phe Pro Ala Leu Gly Thr  
420 425 430

gga aac atg gaa ata aag aag gaa aca gca gca gag att ttg ttt gat  
1344

Gly Asn Met Glu Ile Lys Lys Glu Thr Ala Ala Glu Ile Leu Phe Asp  
435 440 445

gaa gtt tta aca ttt gcc aaa gac cat gta aaa cac cag tta act gta  
1392

Glu Val Leu Thr Phe Ala Lys Asp His Val Lys His Gln Leu Thr Val  
450 455 460

aaa ttt gtg atc ttt cca aca gat ttg gag ata tat aag gct ttc agt  
1440

Lys Phe Val Ile Phe Pro Thr Asp Leu Glu Ile Tyr Lys Ala Phe Ser  
465 470 475 480

tct gaa atg gca aag agg tcc aag atg ctg agt ttg aac aat tac agt  
1488

Ser Glu Met Ala Lys Arg Ser Lys Met Leu Ser Leu Asn Asn Tyr Ser  
485 490 495

gtc ccc cag tca acc aga gag gag aaa aga gaa aat ggg ctt gaa gct  
1536

Val Pro Gln Ser Thr Arg Glu Glu Lys Arg Glu Asn Gly Leu Glu Ala  
500 505 510

aga tct cct gcc atc aat ctg atg gga ttc aac gtg gaa gag atg tat

- 12 -

1584  
Arg Ser Pro Ala Ile Asn Leu Met Gly Phe Asn Val Glu Glu Met Tyr  
515 520 525

gag gcc cac gca tgg atc caa aga atc ctg agt ctc cag aac cac cac  
1632  
Glu Ala His Ala Trp Ile Gln Arg Ile Leu Ser Leu Gln Asn His His  
530 535 540

atc att gag aat aat cat att ctg tac ctt ggg aga aag gaa cat gac  
1680  
Ile Ile Glu Asn Asn His Ile Leu Tyr Leu Gly Arg Lys Glu His Asp  
545 550 555 560

att ttg tct cag ctt cag aaa act tca agt gtc tcc atc aca gaa att  
1728  
Ile Leu Ser Gln Leu Gln Lys Thr Ser Ser Val Ser Ile Thr Glu Ile  
565 570 575

atc agc cca gga agg aca gag tta gag att gaa gga gcc cggt gct gac  
1776  
Ile Ser Pro Gly Arg Thr Glu Leu Glu Ile Glu Gly Ala Arg Ala Asp  
580 585 590

ctc att gag gtg gtt atg aac att gaa gat atg ctt tgt aaa gta cag  
1824  
Leu Ile Glu Val Val Met Asn Ile Glu Asp Met Leu Cys Lys Val Gln  
595 600 605

gag gaa atg gca agg aaa aag gag cga ggc ctt tgg cgc tcg tta gga  
1872  
Glu Glu Met Ala Arg Lys Lys Glu Arg Gly Leu Trp Arg Ser Leu Gly  
610 615 620

cag tgg act att cag caa caa aaa acc caa gac gaa atg aaa gaa aat  
1920  
Gln Trp Thr Ile Gln Gln Lys Thr Gln Asp Glu Met Lys Glu Asn  
625 630 635 640

atc ata ttt ctg aaa tgt cct gtg cct cca act caa gag ctt cta gat  
1968  
Ile Ile Phe Leu Lys Cys Pro Val Pro Pro Thr Gln Glu Leu Leu Asp  
645 650 655

caa aag aaa cag ttt gaa aaa tgt ggt ttg cag gtt cta aag gtg gag  
2016  
Gln Lys Lys Gln Phe Glu Lys Cys Gly Leu Gln Val Leu Lys Val Glu  
660 665 670

aag ata gac aat gag gtc ctt atg gct gcc ttt caa aga aag aag aaa  
2064  
Lys Ile Asp Asn Glu Val Leu Met Ala Ala Phe Gln Arg Lys Lys Lys  
675 680 685

atg atg gaa gaa aaa ctg cac agg caa cct gtg agc cat agg ctg ttt  
2112  
Met Met Glu Glu Lys Leu His Arg Gln Pro Val Ser His Arg Leu Phe  
690 695 700

- 13 -

cag caa gtc cca tac cag ttc tgc aat gtg gta tgc aga gtt ggc ttt  
2160

Gln Gln Val Pro Tyr Gln Phe Cys Asn Val Val Cys Arg Val Gly Phe  
705 710 715 720

caa aga atg tac tcg aca cct tgc gat cca aaa tac gga gct ggc ata  
2208

Gln Arg Met Tyr Ser Thr Pro Cys Asp Pro Lys Tyr Gly Ala Gly Ile  
725 730 735

tac ttc acc aag aac ctc aaa aac ctg gca gag aag gcc aag aaa atc  
2256

Tyr Phe Thr Lys Asn Leu Lys Asn Leu Ala Glu Lys Ala Lys Lys Ile  
740 745 750

tct gct gca gat aag ctg atc tat gtg ttt gag gct gaa gta ctc acà  
2304

Ser Ala Ala Asp Lys Leu Ile Tyr Val Phe Glu Ala Glu Val Leu Thr  
755 760 765

ggc ttc ttc tgc cag gga cat ccg tta aat att gtt ccc cca cca ctg  
2352

Gly Phe Phe Cys Gln Gly His Pro Leu Asn Ile Val Pro Pro Pro Leu  
770 775 780

agt cct gga gct ata gat ggt cat gac agt gtg gtt gac aat gtc tcc  
2400

Ser Pro Gly Ala Ile Asp Gly His Asp Ser Val Val Asp Asn Val Ser  
785 790 795 800

agc cct gaa acc ttt gtt att ttt agt ggc atg cag gct ata cct cag  
2448

Ser Pro Glu Thr Phe Val Ile Phe Ser Gly Met Gln Ala Ile Pro Gln  
805 810 815

tat ttg tgg aca tgc acc cag gaa tat gta cag tca caa gat tac tca  
2496

Tyr Leu Trp Thr Cys Thr Gln Glu Tyr Val Gln Ser Gln Asp Tyr Ser  
820 825 830

tca gga cca atg aga ccc ttt gca cag cat cct tgg agg gga ttc gca  
2544

Ser Gly Pro Met Arg Pro Phe Ala Gln His Pro Trp Arg Gly Phe Ala  
835 840 845

agt ggc agc cct gtt gat  
2562

Ser Gly Ser Pro Val Asp  
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 gaatagaggg aaacaggcca ccatctcctc gatctacaga ctacacttgg aaacacaaac 120  
 aatatataat atctgaagac ccacgtggaa cctgaagaat gcgcattttac atg gat 176  
 Met Asp  
 1

aca tgg gcg gca gct ccc gcc gaa aga cca gcc aac aat tct ctt gaa 224  
 Thr Trp Ala Ala Ala Pro Ala Glu Arg Pro Ala Asn Asn Ser Leu Glu  
 5 10 15

gaa cat tat aga tgg caa att ccc att aaa cac aat gtc ttc gaa att 272  
 Glu His Tyr Arg Trp Gln Ile Pro Ile Lys His Asn Val Phe Glu Ile  
 20 25 30

tta aag agc aat gag agt cag cta tgt gaa gtc ctc caa aat aag ttt 320  
 Leu Lys Ser Asn Glu Ser Gln Leu Cys Glu Val Leu Gln Asn Lys Phe  
 35 40 45 50

gga tgc atc tct acc ctg agc tgt cca act cta gca ggg agc agc tct 368  
 Gly Cys Ile Ser Thr Leu Ser Cys Pro Thr Leu Ala Gly Ser Ser Ser  
 55 60 65

cct gct cag aga gtc ttc aga agg acc ctg atc cct ggg ata gag tta 416  
 Pro Ala Gln Arg Val Phe Arg Arg Thr Leu Ile Pro Gly Ile Glu Leu  
 70 75 80

tct gtc tgg aag gat gac ctt acc aga cac gtt gat gct gtg gtg 464  
 Ser Val Trp Lys Asp Asp Leu Thr Arg His Val Val Asp Ala Val Val  
 85 90 95

aac gca gcc aat gaa aac ctt ttg cat gga agt ggc ctg gcc gga agc 512  
 Asn Ala Ala Asn Glu Asn Leu Leu His Gly Ser Gly Leu Ala Gly Ser  
 100 105 110

ttg gtg aaa act ggt ggc ttt gaa atc caa gaa gag agc aaa aga atc 560  
 Leu Val Lys Thr Gly Gly Phe Glu Ile Gln Glu Glu Ser Lys Arg Ile  
 115 120 125 130

att gcc aac gtt ggt aaa atc tca gtt ggt gga atc gct atc acc ggt 608  
 Ile Ala Asn Val Gly Lys Ile Ser Val Gly Gly Ile Ala Ile Thr Gly  
 135 140 145

gcg ggg aga ctt cct tgc cat ttg att atc cat gcg gtt gga cct cgg 656  
 Ala Gly Arg Leu Pro Cys His Leu Ile Ile His Ala Val Gly Pro Arg  
 150 155 160

tgg aca gtt acg aac agc cag aca gct atc gaa tta ctg aaa ttt gcc 704  
 Trp Thr Val Thr Asn Ser Gln Thr Ala Ile Glu Leu Leu Lys Phe Ala  
 165 170 175

att agg aac att cta gat tat gtc acc aaa tat gat cta cgc att aag 752  
 Ile Arg Asn Ile Leu Asp Tyr Val Thr Lys Tyr Asp Leu Arg Ile Lys

- 15 -

180	185	190	
aca gta gca att cca gcc ctg agc tct gga att ttc cag ttc cct ctg			800
Thr Val Ala Ile Pro Ala Leu Ser Ser Gly Ile Phe Gln Phe Pro Leu			
195	200	205	210
gat ttg tgt aca agc ata att tta gaa act atc cgg ctt tat ttc caa			848
Asp Leu Cys Thr Ser Ile Ile Leu Glu Thr Ile Arg Leu Tyr Phe Gln			
215	220	225	
gac aag caa atg ttc ggt aat ttg aga gag att cat ctg gtg agc aat			896
Asp Lys Gln Met Phe Gly Asn Leu Arg Glu Ile His Leu Val Ser Asn			
230	235	240	
gag gac ccc act gtt gcg tcc ttt aaa tcc gcc tca gaa agc atc cta			944
Glu Asp Pro Thr Val Ala Ser Phe Lys Ser Ala Ser Glu Ser Ile Leu			
245	250	255	
ggg agg gac ctg agc tct tgg ggg ggt cca gaa act gac cct gct tcc			992
Gly Arg Asp Leu Ser Ser Trp Gly Gly Pro Glu Thr Asp Pro Ala Ser			
260	265	270	
acc atg act ctt cgc atc ggc cgg ggc ctg act ctc cag att gtc caa			
1040			
Thr Met Thr Leu Arg Ile Gly Arg Gly Leu Thr Leu Gln Ile Val Gln			
275	280	285	290
ggc tgt att gaa atg caa aca aca gat gta att ggt aat tct gga tac			
1088			
Gly Cys Ile Glu Met Gln Thr Thr Asp Val Ile Gly Asn Ser Gly Tyr			
295	300	305	
atg cag gat ttt aaa tca gga cga gtg gca cag tcg att ctt aga caa			
1136			
Met Gln Asp Phe Lys Ser Gly Arg Val Ala Gln Ser Ile Leu Arg Gln			
310	315	320	
gca ggg gtt gaa atg gaa aag gaa ctt gac aag gtt aac ctg tcc aca			
1184			
Ala Gly Val Glu Met Glu Lys Glu Leu Asp Lys Val Asn Leu Ser Thr			
325	330	335	
gat tat caa gag gtg tgg gtc aca aaa gga ttt aaa ttg tcc tgt cag			
1232			
Asp Tyr Gln Glu Val Trp Val Thr Lys Gly Phe Lys Leu Ser Cys Gln			
340	345	350	
tat gtc ttc cat gtg gca tgg cat tcc caa atc aac aaa tac cag ata			
1280			
Tyr Val Phe His Val Ala Trp His Ser Gln Ile Asn Lys Tyr Gln Ile			
355	360	365	370
ttg aaa gat gca atg aag tcc tgt cta gaa aaa tgc ctt aaa cca gat			
1328			
Leu Lys Asp Ala Met Lys Ser Cys Leu Glu Lys Cys Leu Lys Pro Asp			
375	380	385	
ata aat tcc att tcc ttt cct gct ctc ggg aca gga ttg atg gat ttg			

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1376  
Ile Asn Ser Ile Ser Phe Pro Ala Leu Gly Thr Gly Leu Met Asp Leu  
390 395 400

aag aag agt aca gca gct cag ata atg ttt gag gaa gtt ttt gca ttt  
1424  
Lys Lys Ser Thr Ala Ala Gln Ile Met Phe Glu Glu Val Phe Ala Phe  
405 410 415

gct aaa gag cac aag gaa aaa acg cta act gta aag att gtg atc ttt  
1472  
Ala Lys Glu His Lys Glu Lys Thr Leu Thr Val Lys Ile Val Ile Phe  
420 425 430

cca gta gat gtg gag acg tac aag att ttt tat gct gaa atg aca aaa  
1520  
Pro Val Asp Val Glu Thr Tyr Lys Ile Phe Tyr Ala Glu Met Thr Lys  
435 440 445 450

agg tcc aac gag ctg aat ctc agc ggt aat agt ggt gct tta gcc ctg  
1568  
Arg Ser Asn Glu Leu Asn Leu Ser Gly Asn Ser Gly Ala Leu Ala Leu  
455 460 465

cag tgg tcc agt ggg gag caa aga aga ggc ggc ctt gaa gct gga tct  
1616  
Gln Trp Ser Ser Gly Glu Gln Arg Arg Gly Gly Leu Glu Ala Gly Ser  
470 475 480

cct gcc atc aat ctc atg ggt gta aaa gtg gga gag atg tgt gag gcc  
1664  
Pro Ala Ile Asn Leu Met Gly Val Lys Val Gly Glu Met Cys Glu Ala  
485 490 495

cag gaa tgg att gaa agg ttg ctg gtc tcc ctg gac cac cac atc att  
1712  
Gln Glu Trp Ile Glu Arg Leu Leu Val Ser Leu Asp His His Ile Ile  
500 505 510

gag aat aat cat att ctc tat ctt ggg aaa aaa gag cac gac gtc ctg  
1760  
Glu Asn Asn His Ile Leu Tyr Leu Gly Lys Lys Glu His Asp Val Leu  
515 520 525 530

tct gag ctc cag acc agc aca aga gtc tcc att tca gag act gtc agt  
1808  
Ser Glu Leu Gln Thr Ser Thr Arg Val Ser Ile Ser Glu Thr Val Ser  
535 540 545

cca aga acg gcc act ttg gag att aaa ggt ccc cag gct gac ctc att  
1856  
Pro Arg Thr Ala Thr Leu Glu Ile Lys Gly Pro Gln Ala Asp Leu Ile  
550 555 560

gac gca gtt atg agg att gaa tgt atg ctg tgt gac gtt cag gaa gaa  
1904  
Asp Ala Val Met Arg Ile Glu Cys Met Leu Cys Asp Val Gln Glu Glu  
565 570 575

gtg gca gga aaa agg gag aaa aat ctt tgg agc ttg tca gga cag ggg  
1952  
Val Ala Gly Lys Arg Glu Lys Asn Leu Trp Ser Leu Ser Gly Gln Gly  
580 585 590

acc aac cag caa gaa aaa ctg gat aaa atg gaa gaa tcg tac aca ttt  
2000  
Thr Asn Gln Gln Glu Lys Leu Asp Lys Met Glu Glu Ser Tyr Thr Phe  
595 600 605 610

caa cga tac cca gca tca tta act cag gaa ctt cag gac cga aag aaa  
2048  
Gln Arg Tyr Pro Ala Ser Leu Thr Gln Glu Leu Gln Asp Arg Lys Lys  
615 620 625

cag ttt gaa aag tgt ggc ttg tgg gtt gtg cag gtg gag cag ata gac  
2096  
Gln Phe Glu Lys Cys Gly Leu Trp Val Val Gln Val Glu Gln Ile Asp  
630 635 640

aat aag gtg ctg ctg gct gcc ttc caa gag aag aag aaa atg atg gaa  
2144  
Asn Lys Val Leu Leu Ala Ala Phe Gln Glu Lys Lys Lys Met Met Glu  
645 650 655

gag agg acg cca aag gga tct ggg agc caa agg ttg ttt cag cag gtc  
2192  
Glu Arg Thr Pro Lys Gly Ser Gly Ser Gln Arg Leu Phe Gln Gln Val  
660 665 670

cca cat cag ttc tgc aat acg gtg tgc aga gtc ggc ttc cac aga atg  
2240  
Pro His Gln Phe Cys Asn Thr Val Cys Arg Val Gly Phe His Arg Met  
675 680 685 690

tat tcg aca tcc tat aac cca gtt tat gga gcc ggc ata tat ttc acc  
2288  
Tyr Ser Thr Ser Tyr Asn Pro Val Tyr Gly Ala Gly Ile Tyr Phe Thr  
695 700 705

aag agc ctc aaa aat cta gca gac aag gtc aag aaa acc tca agc aca  
2336  
Lys Ser Leu Lys Asn Leu Ala Asp Lys Val Lys Lys Thr Ser Ser Thr  
710 715 720

gac aag cta atc tat gtg ttt gag gca gaa gta ctc aca ggg tcc ttc  
2384  
Asp Lys Leu Ile Tyr Val Phe Glu Ala Glu Val Leu Thr Gly Ser Phe  
725 730 735

tgt cag ggt aat tcc tca aat atc atc cct cca cca ttg agt cct ggg  
2432  
Cys Gln Gly Asn Ser Ser Asn Ile Ile Pro Pro Pro Leu Ser Pro Gly  
740 745 750

gcc tta gat gtc aat gac agc gta gtt gac aat gtt tcc agc cct gaa  
2480

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Ala Leu Asp Val Asn Asp Ser Val Val Asp Asn Val Ser Ser Pro Glu  
755 760 765 770

acc att gtt gtt ttt aat ggc atg cag gcc atg ccc ctg tac ttg tgg  
2528

Thr Ile Val Val Phe Asn Gly Met Gln Ala Met Pro Leu Tyr Leu Trp  
775 780 785

act tgc aca cag gat agg aca ttc tca cag cat ccg atg tgg tca cag  
2576

Thr Cys Thr Gln Asp Arg Thr Phe Ser Gln His Pro Met Trp Ser Gln  
790 795 800

gac tac tca tca gga cca gga atg gtc tct tcg ctg cag tcc tgg gaa  
2624

Asp Tyr Ser Ser Gly Pro Gly Met Val Ser Ser Leu Gln Ser Trp Glu  
805 810 815

tgg gtc tta aat ggc agc tct gtt tagtgtctac atcagttaa caagcagaag  
2678

Trp Val Leu Asn Gly Ser Ser Val  
820 825

gggtttagag aactgacaaa atgataaata acaggttacc tgttcagaat gatggggta  
2738

ctaaaggcac cgaccacaca ctagcatcat agtgccttg tcttacctc tggcattgac  
2798

tggcagatg ccagctaaaa cttcctcaact gtctttcta tttgacatct ttcatctc  
2858

ttcctataagg tgacagcaag aatactttat atagaacaag gatattttt tcaagcctgt  
2918

tatttctaa aatgatagca caaacttagga caacaggatg atttcaggtt ttctatataa  
2978

tttataaagt gctttggata tccaaataaa tcaccttgt ctgagt  
3024

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Glu Ile Leu Lys Ser Asn Glu Ser Gln Leu Cys Glu Val Leu Gln Asn  
35 40 45

Lys Phe Gly Cys Ile Ser Thr Leu Ser Cys Pro Thr Leu Ala Gly Ser

- 19 -

50	55	60
Ser Ser Pro Ala Gln Arg Val Phe Arg Arg Thr Leu Ile Pro Gly Ile		
65	70	75
Glu Leu Ser Val Trp Lys Asp Asp Leu Thr Arg His Val Val Asp Ala		
85	90	95
Val Val Asn Ala Ala Asn Glu Asn Leu Leu His Gly Ser Gly Leu Ala		
100	105	110
Gly Ser Leu Val Lys Thr Gly Gly Phe Glu Ile Gln Glu Glu Ser Lys		
115	120	125
Arg Ile Ile Ala Asn Val Gly Lys Ile Ser Val Gly Gly Ile Ala Ile		
130	135	140
Thr Gly Ala Gly Arg Leu Pro Cys His Leu Ile Ile His Ala Val Gly		
145	150	155
160		
Pro Arg Trp Thr Val Thr Asn Ser Gln Thr Ala Ile Glu Leu Leu Lys		
165	170	175
Phe Ala Ile Arg Asn Ile Leu Asp Tyr Val Thr Lys Tyr Asp Leu Arg		
180	185	190
Ile Lys Thr Val Ala Ile Pro Ala Leu Ser Ser Gly Ile Phe Gln Phe		
195	200	205
Pro Leu Asp Leu Cys Thr Ser Ile Ile Leu Glu Thr Ile Arg Leu Tyr		
210	215	220
Phe Gln Asp Lys Gln Met Phe Gly Asn Leu Arg Glu Ile His Leu Val		
225	230	235
240		
Ser Asn Glu Asp Pro Thr Val Ala Ser Phe Lys Ser Ala Ser Glu Ser		
245	250	255
Ile Leu Gly Arg Asp Leu Ser Ser Trp Gly Gly Pro Glu Thr Asp Pro		
260	265	270
Ala Ser Thr Met Thr Leu Arg Ile Gly Arg Gly Leu Thr Leu Gln Ile		
275	280	285
Val Gln Gly Cys Ile Glu Met Gln Thr Thr Asp Val Ile Gly Asn Ser		
290	295	300
Gly Tyr Met Gln Asp Phe Lys Ser Gly Arg Val Ala Gln Ser Ile Leu		
305	310	315
320		
Arg Gln Ala Gly Val Glu Met Glu Lys Glu Leu Asp Lys Val Asn Leu		
325	330	335
Ser Thr Asp Tyr Gln Glu Val Trp Val Thr Lys Gly Phe Lys Leu Ser		
340	345	350
Cys Gln Tyr Val Phe His Val Ala Trp His Ser Gln Ile Asn Lys Tyr		
355	360	365

- 20 -

Gln Ile Leu Lys Asp Ala Met Lys Ser Cys Leu Glu Lys Cys Leu Lys  
370 375 380

Pro Asp Ile Asn Ser Ile Ser Phe Pro Ala Leu Gly Thr Gly Leu Met  
385 390 395 400

Asp Leu Lys Lys Ser Thr Ala Ala Gln Ile Met Phe Glu Glu Val Phe  
405 410 415

Ala Phe Ala Lys Glu His Lys Glu Lys Thr Leu Thr Val Lys Ile Val  
420 425 430

Ile Phe Pro Val Asp Val Glu Thr Tyr Lys Ile Phe Tyr Ala Glu Met  
435 440 445

Thr Lys Arg Ser Asn Glu Leu Asn Leu Ser Gly Asn Ser Gly Ala Leu  
450 455 460

Ala Leu Gln Trp Ser Ser Gly Glu Gln Arg Arg Gly Gly Leu Glu Ala  
465 470 475 480

Gly Ser Pro Ala Ile Asn Leu Met Gly Val Lys Val Gly Glu Met Cys  
485 490 495

Glu Ala Gln Glu Trp Ile Glu Arg Leu Leu Val Ser Leu Asp His His  
500 505 510

Ile Ile Glu Asn Asn His Ile Leu Tyr Leu Gly Lys Lys Glu His Asp  
515 520 525

Val Leu Ser Glu Leu Gln Thr Ser Thr Arg Val Ser Ile Ser Glu Thr  
530 535 540

Val Ser Pro Arg Thr Ala Thr Leu Glu Ile Lys Gly Pro Gln Ala Asp  
545 550 555 560

Leu Ile Asp Ala Val Met Arg Ile Glu Cys Met Leu Cys Asp Val Gln  
565 570 575

Glu Glu Val Ala Gly Lys Arg Glu Lys Asn Leu Trp Ser Leu Ser Gly  
580 585 590

Gln Gly Thr Asn Gln Gln Glu Lys Leu Asp Lys Met Glu Glu Ser Tyr  
595 600 605

Thr Phe Gln Arg Tyr Pro Ala Ser Leu Thr Gln Glu Leu Gln Asp Arg  
610 615 620

Lys Lys Gln Phe Glu Lys Cys Gly Leu Trp Val Val Gln Val Glu Gln  
625 630 635 640

Ile Asp Asn Lys Val Leu Leu Ala Ala Phe Gln Glu Lys Lys Met  
645 650 655

Met Glu Glu Arg Thr Pro Lys Gly Ser Gly Ser Gln Arg Leu Phe Gln  
660 665 670

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Gln Val Pro His Gln Phe Cys Asn Thr Val Cys Arg Val Gly Phe His  
 675 680 685

Arg Met Tyr Ser Thr Ser Tyr Asn Pro Val Tyr Gly Ala Gly Ile Tyr  
 690 695 700

Phe Thr Lys Ser Leu Lys Asn Leu Ala Asp Lys Val Lys Lys Thr Ser  
 705 710 715 720

Ser Thr Asp Lys Leu Ile Tyr Val Phe Glu Ala Glu Val Leu Thr Gly  
 725 730 735

Ser Phe Cys Gln Gly Asn Ser Ser Asn Ile Ile Pro Pro Pro Leu Ser  
 740 745 750

Pro Gly Ala Leu Asp Val Asn Asp Ser Val Val Asp Asn Val Ser Ser  
 755 760 765

Pro Glu Thr Ile Val Val Phe Asn Gly Met Gln Ala Met Pro Leu Tyr  
 770 775 780

Leu Trp Thr Cys Thr Gln Asp Arg Thr Phe Ser Gln His Pro Met Trp  
 785 790 795 800

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Trp Glu Trp Val Leu Asn Gly Ser Ser Val  
 820 825

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ctt gaa gaa cat tat aga tgg caa att ccc att aaa cac aat gtc ttc 96  
 Leu Glu Glu His Tyr Arg Trp Gln Ile Pro Ile Lys His Asn Val Phe  
 20 25 30

gaa att tta aag agc aat gag agt cag cta tgt gaa gtc ctc caa aat 144  
 Glu Ile Leu Lys Ser Asn Glu Ser Gln Leu Cys Glu Val Leu Gln Asn  
 35 40 45

aag ttt gga tgc atc tct acc ctg agc tgt cca act cta gca ggg agc 192  
 Lys Phe Gly Cys Ile Ser Thr Leu Ser Cys Pro Thr Leu Ala Gly Ser  
 50 55 60

- 22 -

agc tct cct gct cag aga gtc ttc aga agg acc ctg atc cct ggg ata	240
Ser Ser Pro Ala Gln Arg Val Phe Arg Arg Thr Leu Ile Pro Gly Ile	
65 70 75 80	
gag tta tct gtc tgg aag gat gac ctt acc aga cac gtt gtt gat gct	288
Glu Leu Ser Val Trp Lys Asp Asp Leu Thr Arg His Val Val Asp Ala	
85 90 95	
gtg gtg aac gca gcc aat gaa aac ctt ttg cat gga agt ggc ctg gcc	336
Val Val Asn Ala Ala Asn Glu Asn Leu Leu His Gly Ser Gly Leu Ala	
100 105 110	
gga agc ttg gtg aaa act ggt ggc ttt gaa atc caa gaa gag agc aaa	384
Gly Ser Leu Val Lys Thr Gly Gly Phe Glu Ile Gln Glu Glu Ser Lys	
115 120 125	
aga atc att gcc aac gtt ggt aaa atc tca gtt ggt gga atc gct atc	432
Arg Ile Ile Ala Asn Val Gly Lys Ile Ser Val Gly Gly Ile Ala Ile	
130 135 140	
acc ggt gcg ggg aga ctt cct tgc cat ttg att atc cat gcg gtt gga	480
Thr Gly Ala Gly Arg Leu Pro Cys His Leu Ile Ile His Ala Val Gly	
145 150 155 160	
cct cgg tgg aca gtt acg aac agc cag aca gct atc gaa tta ctg aaa	528
Pro Arg Trp Thr Val Asn Ser Gln Thr Ala Ile Glu Leu Leu Lys	
165 170 175	
ttt gcc att agg aac att cta gat tat gtc acc aaa tat gat cta cgc	576
Phe Ala Ile Arg Asn Ile Leu Asp Tyr Val Thr Lys Tyr Asp Leu Arg	
180 185 190	
att aag aca gta gca att cca gcc ctg agc tct gga att ttc cag ttc	624
Ile Lys Thr Val Ala Ile Pro Ala Leu Ser Ser Gly Ile Phe Gln Phe	
195 200 205	
cct ctg gat ttg tgt aca agc ata att tta gaa act atc cgg ctt tat	672
Pro Leu Asp Leu Cys Thr Ser Ile Ile Leu Glu Thr Ile Arg Leu Tyr	
210 215 220	
ttc caa gac aag caa atg ttc ggt aat ttg aga gag att cat ctg gtg	720
Phe Gln Asp Lys Gln Met Phe Gly Asn Leu Arg Glu Ile His Leu Val	
225 230 235 240	
agc aat gag gac ccc act gtt gcg tcc ttt aaa tcc gcc tca gaa agc	768
Ser Asn Glu Asp Pro Thr Val Ala Ser Phe Lys Ser Ala Ser Glu Ser	
245 250 255	
atc cta ggg agg gac ctg agc tct tgg ggg ggt cca gaa act gac cct	816
Ile Leu Gly Arg Asp Leu Ser Ser Trp Gly Gly Pro Glu Thr Asp Pro	
260 265 270	
gct tcc acc atg act ctt cgc atc ggc cgg ggc ctg act ctc cag att	864
Ala Ser Thr Met Thr Leu Arg Ile Gly Arg Gly Leu Thr Leu Gln Ile	
275 280 285	
gtc caa ggc tgt att gaa atg caa aca aca gat gta att ggt aat tct	912
Val Gln Gly Cys Ile Glu Met Gln Thr Thr Asp Val Ile Gly Asn Ser	

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290	295	300	
gga tac atg cag gat ttt aaa tca gga cga gtg gca cag tcg att ctt			960
Gly Tyr Met Gln Asp Phe Lys Ser Gly Arg Val Ala Gln Ser Ile Leu			
305	310	315	320
aga caa gca ggg gtt gaa atg gaa aag gaa ctt gac aag gtt aac ctg			
1008			
Arg Gln Ala Gly Val Glu Met Glu Lys Glu Leu Asp Lys Val Asn Leu			
325	330	335	
tcc aca gat tat caa gag gtg tgg gtc aca aaa gga ttt aaa ttg tcc			
1056			
Ser Thr Asp Tyr Gln Glu Val Trp Val Thr Lys Gly Phe Lys Leu Ser			
340	345	350	
tgt cag tat gtc ttc cat gtg gca tgg cat tcc caa atc aac aaa tac			
1104			
Cys Gln Tyr Val Phe His Val Ala Trp His Ser Gln Ile Asn Lys Tyr			
355	360	365	
cag ata ttg aaa gat gca atg aag tcc tgt cta gaa aaa tgc ctt aaa			
1152			
Gln Ile Leu Lys Asp Ala Met Lys Ser Cys Leu Glu Lys Cys Leu Lys			
370	375	380	
cca gat ata aat tcc att tcc ttt cct gct ctc ggg aca gga ttg atg			
1200			
Pro Asp Ile Asn Ser Ile Ser Phe Pro Ala Leu Gly Thr Gly Leu Met			
385	390	395	400
gat ttg aag aag agt aca gca gct cag ata atg ttt gag gaa gtt ttt			
1248			
Asp Leu Lys Lys Ser Thr Ala Ala Gln Ile Met Phe Glu Glu Val Phe			
405	410	415	
gca ttt gct aaa gag cac aag gaa aaa acg cta act gta aag att gtg			
1296			
Ala Phe Ala Lys Glu His Lys Glu Lys Thr Leu Thr Val Lys Ile Val			
420	425	430	
atc ttt cca gta gat gtg gag acg tac aag att ttt tat gct gaa atg			
1344			
Ile Phe Pro Val Asp Val Glu Thr Tyr Lys Ile Phe Tyr Ala Glu Met			
435	440	445	
aca aaa agg tcc aac gag ctg aat ctc acg ggt aat agt ggt gct tta			
1392			
Thr Lys Arg Ser Asn Glu Leu Asn Leu Ser Gly Asn Ser Gly Ala Leu			
450	455	460	
gcc ctg cag tgg tcc agt ggg gag caa aga aga ggc ggc ctt gaa gct			
1440			
Ala Leu Gln Trp Ser Ser Gly Glu Gln Arg Arg Gly Gly Leu Glu Ala			
465	470	475	480
gga tct cct gcc atc aat ctc atg ggt gta aaa gtg gga gag atg tgt			
1488			

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Gly Ser Pro Ala Ile Asn Leu Met Gly Val Lys Val Gly Glu Met Cys  
485 490 495

gag gcc cag gaa tgg att gaa agg ttg ctg gtc tcc ctg gac cac cac  
1536

Glu Ala Gln Glu Trp Ile Glu Arg Leu Leu Val Ser Leu Asp His His  
500 505 510

atc att gag aat aat cat att ctc tat ctt ggg aaa aaa gag cac gac  
1584

Ile Ile Glu Asn Asn His Ile Leu Tyr Leu Gly Lys Lys Glu His Asp  
515 520 525

gtg ctg tct gag ctc cag acc agc aca aga gtc tcc att tca gag act  
1632

Val Leu Ser Glu Leu Gln Thr Ser Thr Arg Val Ser Ile Ser Glu Thr  
530 535 540

gtc agt cca aga acg gcc act ttg gag att aaa ggt ccc cag gct gac  
1680

Val Ser Pro Arg Thr Ala Thr Leu Glu Ile Lys Gly Pro Gln Ala Asp  
545 550 555 560

ctc att gac gca gtt atg agg att gaa tgt atg ctg tgt gac gtt cag  
1728

Leu Ile Asp Ala Val Met Arg Ile Glu Cys Met Leu Cys Asp Val Gln  
565 570 575

gaa gaa gtg gca gga aaa agg gag aaa aat ctt tgg agc ttg tca gga  
1776

Glu Glu Val Ala Gly Lys Arg Glu Lys Asn Leu Trp Ser Leu Ser Gly  
580 585 590

cag ggg acc aac cag caa gaa aaa ctg gat aaa atg gaa gaa tcg tac  
1824

Gln Gly Thr Asn Gln Gln Glu Lys Leu Asp Lys Met Glu Glu Ser Tyr  
595 600 605

aca ttt caa cga tac cca gca tca ttaact cag gaa ctt cag gac cga 1872  
Thr Phe Gln Arg Tyr Pro Ala Ser Leu Thr Gln Glu Leu Gln Asp Arg  
610 615 620

aag aaa cag ttt gaa aag tgt ggc ttg tgg gtt gtg cag gtg gag cag  
1920

Lys Lys Gln Phe Glu Lys Cys Gly Leu Trp Val Val Gln Val Glu Gln  
625 630 635 640

ata gac aat aag gtg ctg ctg gct gcc ttc caa gag aag aag aaa atg  
1968

Ile Asp Asn Lys Val Leu Leu Ala Ala Phe Gln Glu Lys Lys Met  
645 650 655

atg gaa gag agg acg cca aag gga tct ggg agc caa agg ttg ttt cag  
2016

Met Glu Glu Arg Thr Pro Lys Gly Ser Gly Ser Gln Arg Leu Phe Gln  
660 665 670

cag gtc cca cat cag ttc tgc aat acg gtg tgc aga gtc ggc ttc cac

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2064  
Gln Val Pro His Gln Phe Cys Asn Thr Val Cys Arg Val Gly Phe His  
675 680 685

aga atg tat tcg aca tcc tat aac cca gtt tat gga gcc ggc ata tat  
2112  
Arg Met Tyr Ser Thr Ser Tyr Asn Pro Val Tyr Gly Ala Gly Ile Tyr  
690 695 700

ttc acc aag agc ctc aaa aat cta gca gac aag gtc aag aaa acc tca  
2160  
Phe Thr Lys Ser Leu Lys Asn Leu Ala Asp Lys Val Lys Lys Thr Ser  
705 710 715 720

agc aca gac aag cta atc tat gtg ttt gag gca gaa gta ctc aca ggg  
2208  
Ser Thr Asp Lys Leu Ile Tyr Val Phe Glu Ala Glu Val Leu Thr Gly  
725 730 735

tcc ttc tgt cag ggt aat tcc tca aat atc atc cct cca cca ttg agt  
2256  
Ser Phe Cys Gln Gly Asn Ser Ser Asn Ile Ile Pro Pro Pro Leu Ser  
740 745 750

cct ggg gcc tta gat gtc aat gac agc gta gtt gac aat gtt tcc agc  
2304  
Pro Gly Ala Leu Asp Val Asn Asp Ser Val Val Asp Asn Val Ser Ser  
755 760 765

cct gaa acc att gtt ttt aat ggc atg cag gcc atg ccc ctg tac  
2352  
Pro Glu Thr Ile Val Val Phe Asn Gly Met Gln Ala Met Pro Leu Tyr  
770 775 780

ttg tgg act tgc aca cag gat agg aca ttc tca cag cat ccg atg tgg  
2400  
Leu Trp Thr Cys Thr Gln Asp Arg Thr Phe Ser Gln His Pro Met Trp  
785 790 795 800

tca cag gac tac tca tca gga cca gga atg gtc tct tcg ctg cag tcc  
2448  
Ser Gln Asp Tyr Ser Ser Gly Pro Gly Met Val Ser Ser Leu Gln Ser  
805 810 815

tgg gaa tgg gtc tta aat ggc agc tct gtt  
2478  
Trp Glu Trp Val Leu Asn Gly Ser Ser Val  
820 825